

WHAT IS CLAIMED IS:

- 1 1. A method of controlling a temperature of an applicator body, the
2 method comprising:
 - 3 providing an applicator body that comprises at least one contact surface;
 - 4 delivering a coolant through a conduit in at least a portion of the applicator
 - 5 body at a substantially constant rate;
 - 6 delivering energy to at least one of the distal end of an applicator body and
 - 7 coolant through one or more heating elements so that the contact surface of the applicator
 - 8 body is cooled to a desired temperature.
- 1 2. The method of claim 1 comprising contacting the contact surfaces
2 against a surface adjacent pelvic support tissue.
- 1 3. The method of claim 2 wherein the cooled contact surface cools the
2 contacted tissue that is adjacent the pelvic support tissue to a temperature between 0°C and
3 40°C.
- 1 4. The method of claim 1 wherein the desired temperature is between
2 about - 5°C and about 3°C.
- 1 5. The method of claim 3 wherein the desired temperature is about -2°C.
- 1 6. The method of claim 1 wherein the coolant comprises a R134a
2 refrigerant gas.
- 1 7. The method of claim 1 wherein the contact surface comprises one or
2 more electrodes.
- 1 8. The method of claim 7 comprising reducing a power level of the
2 energy delivered to the heating element when a therapeutic heating energy is delivered to the
3 one or more electrodes.
- 1 9. The method of claim 1 comprising:
 - 2 monitoring a temperature of the one or more electrodes; and
 - 3 adjusting a power level of the energy delivered to the heating element to
 - 4 maintain the contact surface of the applicator body at substantially the desired temperature.

1 10. The method of claim 1 wherein the heating element comprises a
2 plurality of resistive heating elements positioned within the applicator body.

1 11. The method of claim 10 wherein the resistive heating element(s)
2 contact a portion of the applicator body surrounding the coolant.

1 12. The method of claim 10 wherein the resistive heating element(s) may
2 be positioned in such a way as to minimize a flow related spatial distribution of temperature
3 across the contact surface.

1 13. The method of claim 12 wherein the spatial distribution of temperature
2 across the contact surface is reduced to less than about 2 degrees Celsius.

1 14. The method of claim 12 wherein the resistors are chosen to be at
2 different wattage values in such a way as to reduce a flow related spatial distribution of
3 temperature across the contact surface while still permitting use of a single power source.

1 15. The method of claim 1 wherein providing the applicator body
2 comprises providing the coolant in a path for distributing the coolant substantially evenly
3 over the contact surface.

1 16. The method of claim 15 wherein the path is a serpentine path.

1 17. An applicator that delivers energy comprising:
2 an applicator body comprising a proximal portion and a distal portion;
3 a contact surface on the distal portion of the applicator body;
4 a conduit that delivers a coolant on a path through at least a part of the distal
5 portion of the applicator body; and

6 one or more heating elements coupled to the distal portion of the applicator
7 body to deliver a heating energy to the coolant in the conduit, wherein the energy is sufficient
8 to heat the coolant so that the applicator contact surface is at a desired temperature.

1 18. The applicator of claim 17 wherein the contact surface comprises at
2 least one electrode.

1 19. The applicator of claim 18 further comprising an RF power source
2 coupled to the electrodes.

1 20. The applicator of claim 18 further comprising a control assembly that
2 controls the delivery of the coolant and the heating element(s).

1 21. The applicator of claim 18 wherein the heating energy delivered to the
2 heating element(s) is discontinued when a therapeutic energy is delivered to the electrodes.

1 22. The applicator of claim 17 further comprising a power supply coupled
2 to the heating element(s), wherein the power supply is controlled with a temperature control
3 algorithm.

1 23. The applicator of claim 17 wherein the heating element(s) comprises
2 resistive heating elements.

1 24. The applicator of claim 23 wherein the heating elements are positioned
2 to reduce a temperature differential across the contact surface to less than about 2 degrees
3 Celsius.

1 25. The applicator of claim 23 wherein the contact surface defines a
2 proximal end and a distal end, wherein the heating elements are positioned to deliver more
3 energy toward the proximal end of the contact surface.

1 26. The applicator of claim 17 wherein a flow of the coolant is
2 substantially constant.

1 27. The applicator of claim 17 wherein the desired temperature of the
2 contact surface is between about - 5°C and about 3°C.

1 28. The applicator of claim 17 wherein the coolant comprises a R134a
2 refrigerant gas.

1 29. The applicator of claim 17 wherein the coolant path through the distal
2 portion of the applicator is a serpentine path.

1 30. The applicator of claim 17 further comprising a temperature sensor that
2 monitors a temperature of the contact surface.

1 31. A system for heating a target tissue adjacent an intermediate tissue, the
2 system comprising: 

3 a body comprising one or more electrodes oriented for contacting the
4 intermediate tissue;
5 a control system coupled to a power source and to the electrode(s), the control
6 system adapted to selectively energize the electrode(s) so as to deliver a therapeutic heating
7 energy through the intermediate tissue to the target tissue;
8 a cooling assembly configured to control a temperature of the contact surface,
9 wherein the cooling assembly comprises:
10 a flow conduit positioned in the body to deliver a coolant adjacent the
11 electrode(s);
12 a heating element positioned adjacent the electrode(s) and flow conduit
13 to deliver energy to the flow conduit;
14 a temperature sensor positioned adjacent the electrode that measures a
15 temperature of the electrode; and
16 a control assembly to selectively control the delivery of energy to the heating
17 element and energy to the electrode(s).

1 32. The system of claim 31 further comprising the power source, wherein
2 the power source is an RF power source.

1 33. The system of claim 31 wherein the temperature sensor comprises a
2 thermocouple.

1 34. The system of claim 31 wherein the coolant comprises a R134a gas.

1 35. A system for controlling a temperature of an intermediate tissue
2 contacted by a contact surface of an applicator, the system comprising:
3 a processor;
4 a memory coupled to the processor, the memory configured to store a plurality
5 of code modules for execution by the processor, the plurality of code modules comprising:
6 a code module for delivering a coolant through a conduit in the
7 applicator;
8 a code module for monitoring a temperature of the contact surface; and
9 a code module for controlling delivery of energy to a heating element
10 that controls a temperature of the coolant adjacent the contact surface.